

# Columbia/Snake River Temperature TMDL



## Geographic Scope

- Columbia River from the Canadian border (RM 745.0) to the Pacific Ocean.
- Snake River from it's confluence with the Salmon River (RM 188) to it's confluence with the Columbia River (Columbia RM 324.3).

## What is a TMDL?

- The amount of a pollutant that a waterbody can receive and still meet water quality standards.
- The sum of allowable loads from point and nonpoint sources, considering seasonal variation and a margin of safety.
- Determines sources of pollutants causing or contributing to impairment.
- Allocates responsibility for reductions needed to achieve water quality standards.

## State and Tribal Agencies with a CWA role in the Project Area

- Colville Confederated Tribes
- Idaho Department of Environmental Quality
- Oregon Department of Environmental Quality
- Spokane Tribe of Indians
- Washington Department of Ecology

## Columbia/Snake River 303(d) Listings for Temperature

- Columbia River RM 0 to RM 309.3 from the Pacific Ocean along the Washington/Oregon border is currently listed as water quality impaired for temperature on both the Washington and Oregon 303(d) Lists.
- Snake River from its confluence with the Salmon River to its confluence with the Columbia River is listed as water-quality impaired for temperature on the Washington, Idaho and/or Oregon 303(d) Lists.

## Columbia/Snake River 303(d) Listings for Temperature (cont)

- The Columbia River RM 545.1 to RM 745.0 from Chief Joseph Dam to the Canadian Border is listed as water-quality impaired for temperature by the State of Washington.

## What is the technical process?

- Define the numerical targets for the TMDL.
- Characterize existing conditions.
- Identify sources and evaluate linkages between sources and temperature response of the river.
- Quantify loading capacity.
- Allocate loads.

## Water Quality Standards

- Vary by State and Tribe and by river reach within states;
- We will have to reconcile the differences in standards reach by reach;
- The more stringent standard will generally apply;
- WA and OR prohibitions against human activity that raises temperature above a threshold apply to most of the system.



## Applicable Water quality Standards

### • Washington Columbia River:

Canadian border to Grand Coulee Dam is:

The temperature shall not exceed 16.0 C (60.8 F) due to human activities. When natural conditions exceed 16.0 C (60.8 F), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 C (0.5 F).

## Applicable Water quality Standards

### • Washington Columbia River:

Grand Coulee Dam to Priest Rapids Dam is:

The temperature shall not exceed 18.0 C (64.4 F) due to human activities. When natural conditions exceed 18.0 C (64.4 F), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 C (0.5 F).

## Applicable Water quality Standards

### • Washington Columbia River:

Priest Rapids Dam to the Washington/Oregon border is:

The temperature shall not exceed 20.0 C (68 F) due to human activities. When natural conditions exceed 20.0 C (68 F), no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 C (0.5 F) nor shall such temperature increase, at any time, exceed  $t=34/(T+9)$ .

## Applicable Water Quality Standards

### • Oregon Columbia River:

From the Washington/Oregon border (RM 309.3) to the Pacific Ocean.

".... no measurable surface water temperature increase resulting from anthropogenic activities is allowed in the Columbia River or its associated sloughs and channels from the mouth to river mile 309 when surface water temperatures exceed 68.0 F (20.0 C)." (7 day moving average)

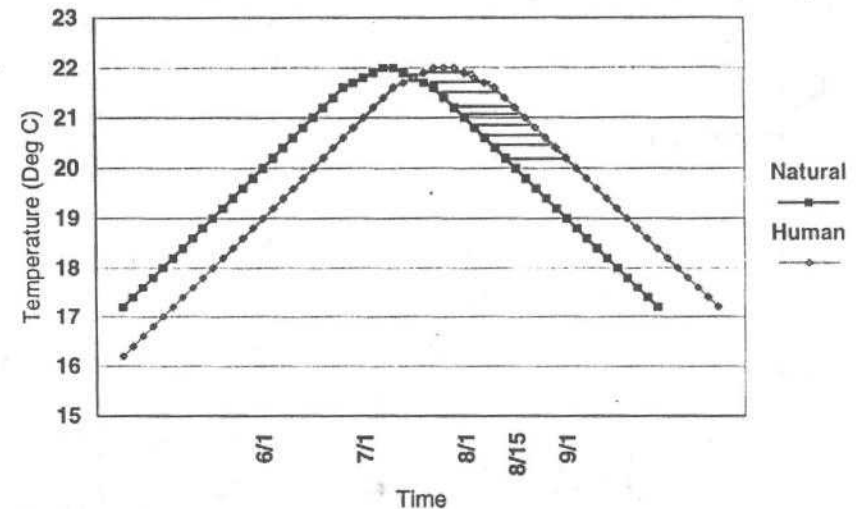
## Define the numerical targets for the TMDL.

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- Water quality standards.
- Characterize natural conditions using the temperature model and existing data.
- Select the target conditions (3 options).
  - Run 50 years of natural condition simulations. Select the 70th, 80th or 90th percentile curve;
  - Like #1 but establish a date for return to the threshold temperature.
  - Correlate the standard with some environmental parameter like flow or air temperature.

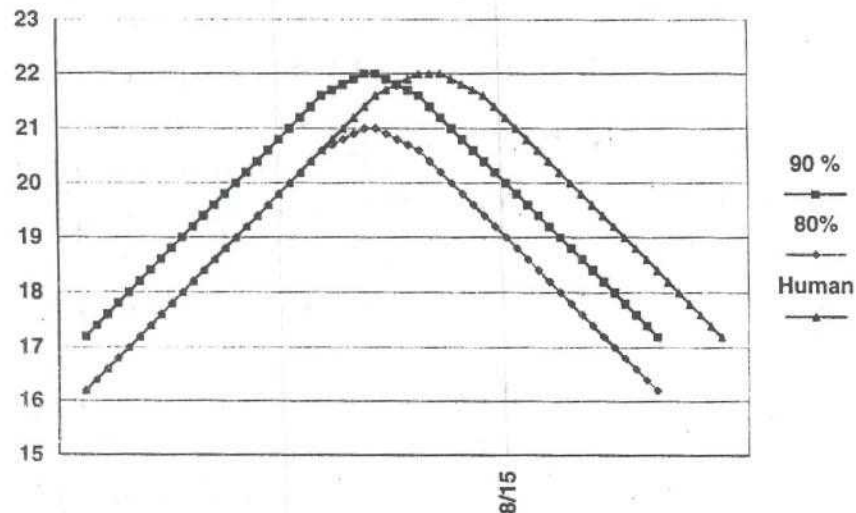
## Interpretation of Water Quality Standard

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## Setting the numerical target

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## Characterize Existing Conditions

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- Temperature model;
- Existing data.

## Identify sources and evaluate linkage of sources to river response.

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- Use the temperature model to quantify effects of:
  - Dams,
  - NPDES dischargers,
  - Tributaries.

## Quantify loading capacity

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- Target temperature regime will come from the natural conditions simulation.
- Can compute loading capacity in kcal from the temperature and flow from target regime.
- Factor in a margin of safety (10%?) after evaluating the natural condition simulations against existing data and trying to quantify uncertainty.

## Allocate loads

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- The allocation for most sources will be the loading capacity - the MOS.
- In reaches where the threshold changes the new, capacity will be allocated among the sources in the reach (Grand Coulee and Priest Rapid.)